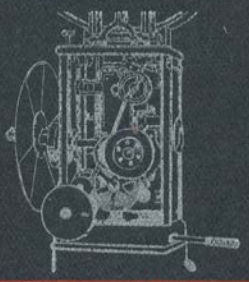
MOTIOGRAPH De Luxe

INSTRUCTOR



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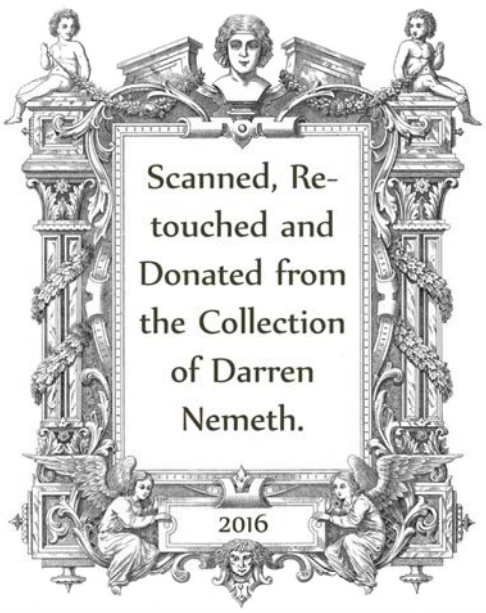
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INSTRUCTIONS

for INSTALLATION AND OPERATION OF THE

Motiograph De Luxe

AND

Motiograph Special Projectors.

INDEX

— MANUFACTURED BY —

THE ENTERPRISE OPTICAL MFG. CO.

564 W. Randolph Street, Chicago, Ill.

NM-B-AI

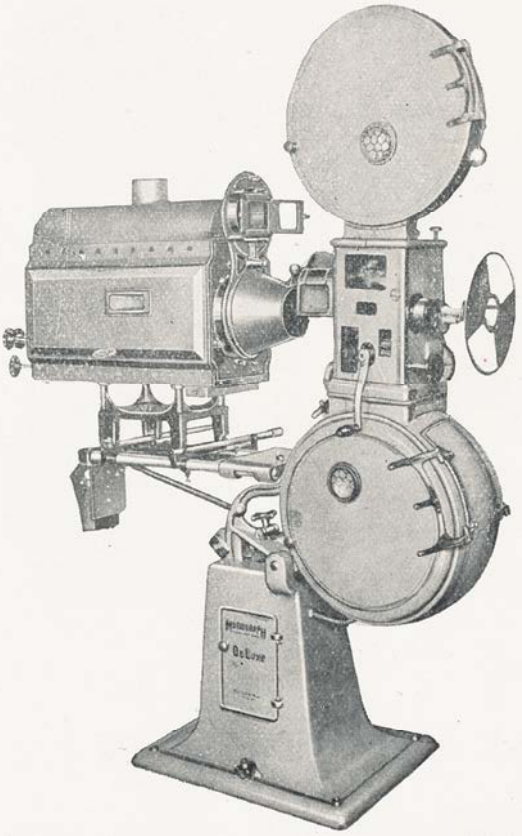
Foreword

We are interested that Motiograph Projectors render unfailing service and satisfaction. They are built for that purpose but the user must do his part after the machine comes into his possession. The Motiograph is capable of rendering the best of service and directions are furnished which will guide the user toward obtaining that service. But if he persists in ignoring these directions, there is no one but himself upon whom he can rightfully place the responsibility for difficulties which may result.

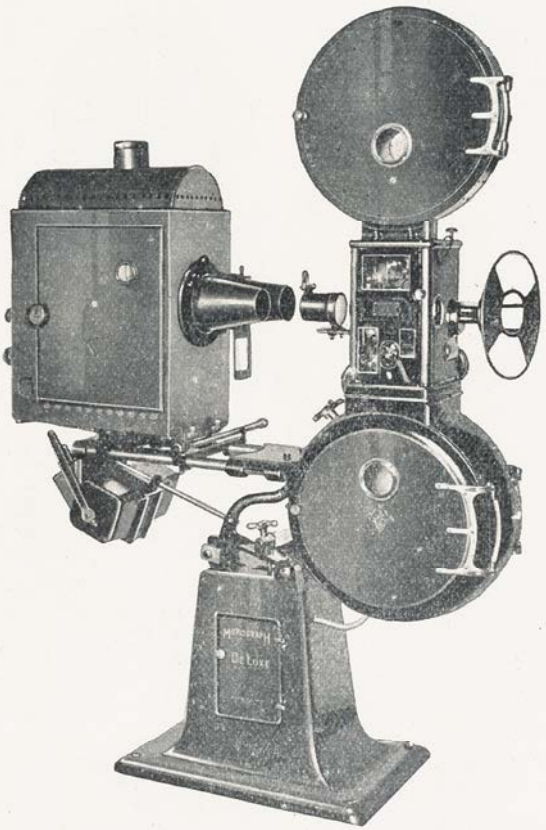
With well designed and correctly built projectors, probably 95 per cent of the so-called "troubles" are directly traceable to lack of lubrication, abuse, carelessness, and a lack of an understanding of the principles involved.

To begin with, the projectionist or user should study the construction of his machine and thoroughly acquaint himself with its mechanism, the functions of its various parts and the "why" of everything connected with it. If he understands these he is better able to realize why certain things must be done and why certain other things must not be done if he is to obtain the most satisfactory results, the greatest efficiency and the greatest economy, together with durability and long life of the mechanism and the balance of the equipment. Remember that the difference between a comprehensive understanding of your projector and the superficial knowledge possessed by many users is the difference between having "troubles" and not having them.

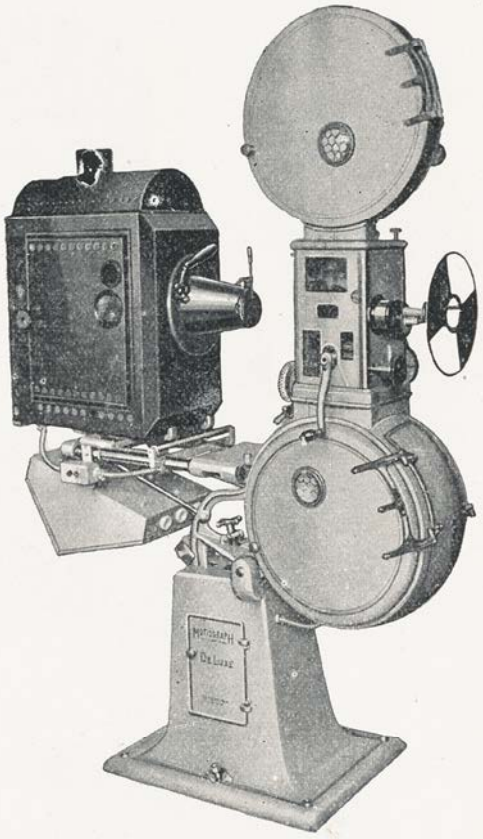
On the other hand is frequently found the user who is constantly tinkering with his projector when there is no necessity for it. Avoid both extremes. If, after seeing that all parts are lubricated properly and in perfect adjustment, let it alone. Many users run their Motiographs for months without finding any adjustment necessary. If adjustment seems necessary and you are not sufficiently acquainted with the construction of the machine to know what adjustment is necessary or how to make it, don't experiment but take or send it to a Motiograph distributor.



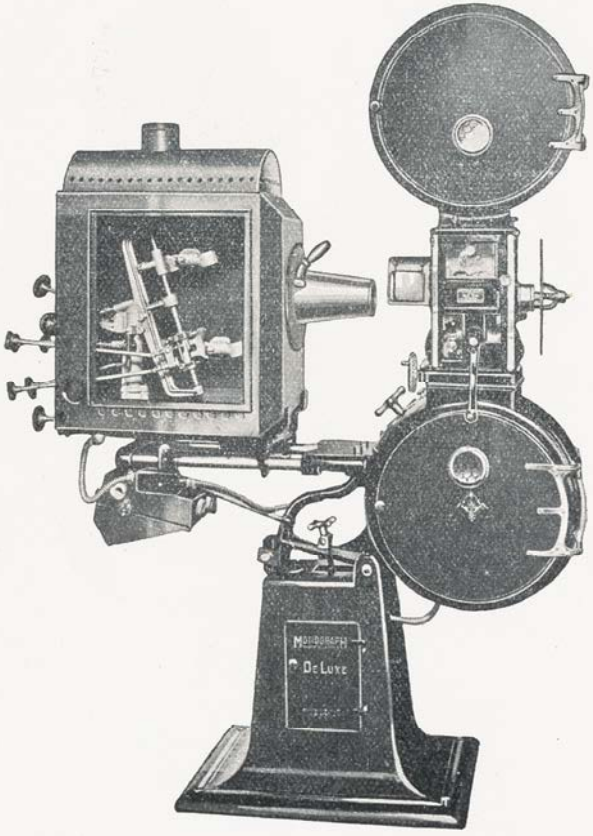
Motiograph De Luxe Projector with
Motiograph Reflecting Arc Lamp



Motiograph De Luxe Projector with De Luxe Incandescent Equipment



Motiograph De Luxe Projector with De Luxe
High Intensity Lamp



Motiograph De Luxe Projector with De Luxe Regular Arc Lamp

Motiograph Special Projector with
Regular Arc Lamp

Assembling Instructions

After unpacking it is suggested that all parts of the equipment be arranged in a clear open floor space where they may be conveniently inspected.

Before beginning assembling, carefully check items and should there be an apparent shortage, especially of small parts, make a careful search for them in the packing material. Complaints of shortages are usually traced to haste in unpacking and leaving small parts unnoticed in the packing material.

Wipe all parts free from dust and excelsior and clean off the anti-rust grease which is applied to protect the parts during shipment.

Assembling.

The lower magazine, floor base and lamphouse support are shipped assembled. Should it be found that this assembly as a unit is too large to be conveniently moved to the projection room, the lower magazine may be readily removed from the floor base by loosening the four set screws holding the tilting shaft in position now permitting the shaft to be driven out. After this has been done, loosen the three clamping screws for tilting segment and drive out the small taper pin holding the hand wheel to the screw shaft. The entire magazine may now be lifted bodily from the floor base. Re-assembling of these two portions after equipment has been moved to the projection room is simply a reversal of the foregoing instructions.

—NOTE—

These instructions apply to all models of the De Luxe or Special projector regardless of whether they are equipped with High Intensity, Reflecting Arc, Vertical Arc or Incandescent Lamp equipment.

Attaching High Intensity, Incandescent or Vertical Arc Lamphouses to Sliding Carriage.

Remove the three screws on the bosses at the rear end of the sliding carriage casting, place flat slide rod in position and fasten with the three screws. Slide lamphouse into position, then insert round slide rod, making sure that the set collars are properly placed one on each side of the lamphouse base bosses. Insert screw to clamp round slide rod to carriage casting and tighten.

—NOTE—

Set collars on round slide rod are used to line up lamphouse laterally with aperture plate after complete equipment is set up.

Special instructions for attaching Reflecting Arc Lamphouses are given in instructions for Installation and Operation of Motiograph Reflecting Arc.

Attaching Mechanism.

Place mechanism in position on flat top of lower magazine casting. The mechanism is held in position by four screws which are inserted upwards through the flat top on the lower magazine. It will be found easiest to first insert the screw to the left hand on the film side of the mechanism; then the screw diagonally opposite on the take-up side. Do not set these two screws up tight until the other two screws are started. The method of attaching the framing handle and crank handle will be obvious.

—NOTE—

NO NOT CROSS the take-up belt. It is not designed to operate that way. The film is corrected in rewinding to bring the emulsion side out properly for reshowing. In rewinding simply run the film straight across from the top of one reel to the top of the other or from the bottom of one reel to the bottom of the other. Do not rewind from the bottom of one reel to the top of the other.

New take-up belts are sometimes too tight for proper take-up tension. This can readily be corrected by running the projector without film for a few moments with the idler take-up tension roller screwed up tight against the belt. Then release the roller the proper amount for perfect take-up tension. This tension should be just sufficient to revolve the take-up reel when it is full of film. Any excess of this amount of tension will result in losing the lower loop.

Attaching the Shutter.

Attach the shutter in the regular manner by sliding it on the shutter shaft, but make sure that the dowel pin on the shutter collar that is fastened to the shaft engages with the dowel hole in the hub of the shutter. When this is correctly done the shutter is correctly set as this point is taken care of on all mechanisms at the factory before they are shipped. The same applies to 2 or 3 wing shutters which can readily be changed without the necessity of resetting the shutter collar. Instructions for operating the Shutter Setting Device will be found under Mechanism Adjustments.

Attaching Upper Magazine.

The upper magazine fastens to the top of the mechanism by four set screws which hold it securely in place. When stereopticon attachment is used, the stereo lens bracket fastens directly to the lower part of the upper magazine casting in which is inserted the focusing adjustment screw. Also attached to the upper magazine will be found a reel end alarm. On the arched roller arm on the inside of the magazine a small set screw is located so that the alarm can be set for operation at practically any distance from the end of the reel. This setting is, of course, to be decided upon by the operator of the equipment.

Upper Reel Tension.

The upper magazine reel shaft is equipped with a tension device to act as a retard on the upper reel to overcome the accumulation of loose film, were it to race ahead as is often the case when imperfect or bent reels are used. However, should the amount of tension be too great, it is only necessary to apply one or two drops of oil at the point where the leather makes contact with the reel shaft or loosen the one screw which holds the spring proper.

Mechanism Pilot Lamp.

Leads to connect the pilot lamp to feeding line enter the mechanism through the front plate.

We strongly recommend the use of our Special Pilot Lamp Reducer to cut down the line voltage to the proper pressure for the 6 volt bulb of the pilot lamp. The Pilot Lamp Reducer can be used on either A. C. or D. C. current of 110 volts and should be mounted on the take-up side of the lower magazine on the cross casting which forms the support for the take-up shaft housing. An outlet bushing is provided for the leads in front of the lower magazine casting as well as a separable connector for the mechanism. By mounting the reducer as mentioned it can be connected directly to the line side of the machine motor switch.

Attaching Motor Unit.

The motor unit is assembled complete and consists of motor, steel driving disc, motor table, conduit wire and fittings.

On the take-up side of the lower magazine near the top will be found a bearing hole through which the round stud on the motor table enters. Inside will be found the rocker arm casting with two clamping screws which clamp the round stud on the motor table to the rocker arm casting. Loosen these two screws, then proceed to attach the motor unit by first pushing the conduit (projecting from the round stud on the motor table) through the bearing hole, then see that the stud enters until the shoulder on the stud comes against the magazine casting. Turn the speed control handle clockwise as far as it will go and rock the motor and table until the edge of the steel discs on the motor shaft is about ¼" from the edge of the fibre discs of the gripping disc unit. Now tighten the two clamping screws on the rocker arm casting.

Wiring Connections for Motor.

One side of the motor switch is already connected to wires from conduit which enters floor base. The two wires from conduit on the motor are simply connected to the other side of the motor switch.

Lining Motor and Gripping Disc Unit.

—CAUTION—

The correct performance of the De Luxe Speed Control depends entirely upon the proper alignment of the motor and gripping disc unit of the mechanism. It is highly important that the following instructions regarding this adjustment be carefully followed. These parts are perfectly lined up at the factory, but in separating them for shipment and packing it becomes necessary for the user to see that they are again properly adjusted BEFORE ATTEMPTING TO OPERATE the projector by power from the motor.

Adjust the speed control so that the steel disc on the motor shaft is just about to enter the fibre discs on the gripping disc unit but not touching them. The motor MUST NOT be running. Taking the steel disc on the motor shaft between the fingers it will be noticed that there is about 5/32″ end play in the motor shaft. This end play is purposely allowed for a reason later explained. Push the steel disc inward toward the mechanism as far as it will go so that all end play of the shaft in that direction is taken up. At this position the steel disc should line up either exactly with the center of the two fibre gripping discs or be not more than 1/32″ past the center toward the mechanism. If it is not found in this proper position, loosen the set screw which holds the steel disc to the motor shaft and adjust it correctly. DO NOT attempt to judge the proper position of the steel disc with the motor running. This adjustment must be made with the motor idle and all end play of the motor shaft taken up in the direction toward the mechanism as explained.

While in operation it will be observed that as the steel disc enters further into the fibre discs, the outer fibre disc (the one farthest away from the mechanism) moves gradually outward as the steel disc is advanced into the fibre discs, while the inner fibre disc remains in its fixed position except for rotating. It is for this purpose that end play in the motor shaft is allowed to give the steel disc full freedom to follow the outer fibre disc.

—CAUTION—

Never force the steel disc into the fibre discs with the motor not running. To do so may cause the fibre discs to be damaged or sprung out of true. Always have the motor running when inserting the steel disc into the fibre gripping discs.

Pedestal and Tilting Adjustment

The main floor base or pedestal of the Motiograph De Luxe Projector remains flat on the floor at all times regardless of the angle that the machine proper is tilted to. In each of the four corners of the floor base there is located a hollow leveling screw plug which, when properly adjusted, will not only level the entire equipment, but will also insure solid contact with the floor at each point, thereby overcoming any vibration that is liable to be caused by unevenness of the floor. After the base has been properly set, the bolts and washers used to tighten the equipment to the floor are placed in position. The washer under the head of the bolt and the bolt entered through the hole in the center of the leveling screw plug, and when tightened the entire equipment is permanently fastened in correct position to the floor. The floor base is equipped with bushings for the arc lamp and motor leads, to be used when it is convenient to bring all the wiring for the projector up through the center of the floor base.

Tilting.

This is accomplished very easily and after the projector has been set to the proper angle it can be permanently set. To tilt, either up or down, loosen the large cap screw holding the clamp lug at the rear end on top of the floor base and turn the hand wheel either way as desired.

When the correct position has been obtained, again tighten the cap screw which operates against the clamping lug on the tilting segment and the equipment is permanently locked for the proper tilt.

With each equipment we furnish a special wrench one end of which fits the cap screw for the tilting clamp and the other end fits the slots of the floor base leveling screws.

Mechanism Adjustments

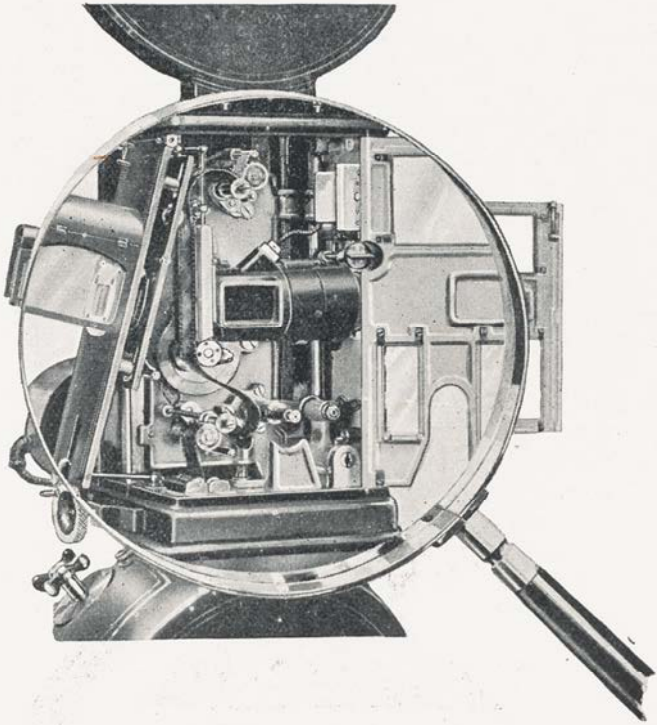
—NOTE—

All mechanisms before leaving the factory pass through two very thorough inspections—the first being a mechanical inspection in which all parts and adjustments are checked, and the second an actual running test which includes the projection of a test film on a screen. During these two inspections and tests all adjustments of the mechanism are accurately made and there should be no need for the purchaser to make any adjustment of any kind (other than instructed herewith) for a considerable length of time, or in other words until natural wear makes such adjustment necessary. For this reason we caution the user not to attempt to improve on the adjustments which have been perfectly made at the factory. The following adjustment instructions are given the user merely for his information and for use only at the time when they will become necessary.

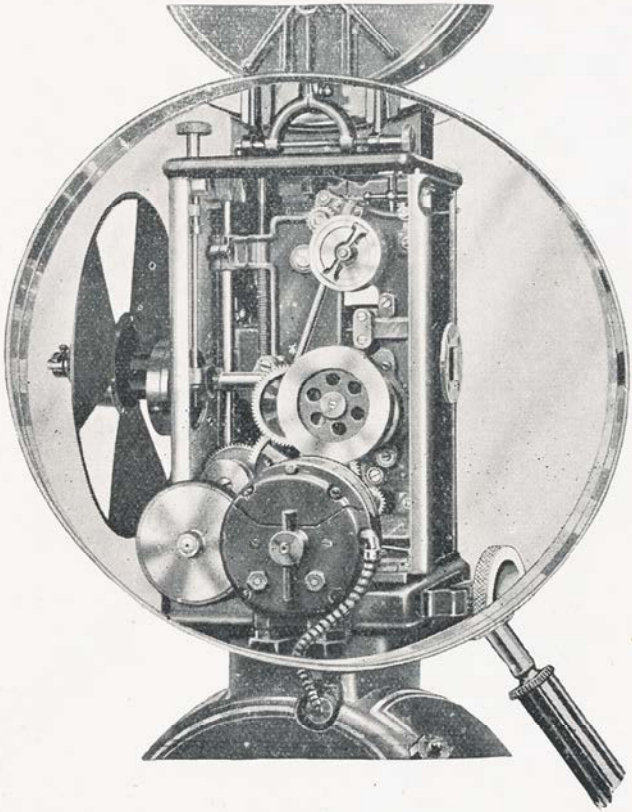
Removing Double Bearing Intermittent Movement From Mechanism.

The double bearing movement may be removed from the mechanism complete as a unit. To accomplish this, first open the film gate to free the intermittent sprocket shoe from the sprocket. This is important as otherwise the sprocket will be damaged in the removal. Remove the large door from the take-up side of the mechanism. Next it is necessary to remove the large main gear. This gear is locked to the crank shaft by a retaining screw. Back this screw off a few turns with a screw driver and by hitting the end of the screw driver with the palm of the hand sharply the screw will free the crank shaft from the gear. Now remove the retaining screw completely and draw the crank shaft free of the gear. The gear itself may now be removed by grasping its lower portion with the fingers and drawing it toward you, gently rocking the gripping disc unit at the same time to facilitate its removal. Should it be found that the gear does not readily come free its removal may be made more easy by taking off the gear on the lower sprocket shaft. However, this is usually not necessary and in replacing the lower sprocket shaft gear care must be used to see that the set screw seats properly on the "flat" provided for it on the shaft.

The removal of the movement itself may now be made. The movement is clamped to the center frame of the mechanism by two screws operating against sliding slotted washers. Loosen these screws a turn and slide the washers free from the flange of the movement casing. Grasp the balance wheel of the movement and draw the movement straight out until it is partly free from the center frame casting, then turn it about half a turn around when it will be found that it can be removed. Do this gently, working the movement around so that the sprocket or other parts of the movement are not forced against the parts of the mechanism and so damaged.



Film Side of Motiograph De Luxe Mechanism Showing Film Path When Properly Threaded



Take-Up Side of Motiograph De Luxe Mechanism Showing Location of Beltless Speed Control and Motor

Replacing the Movement.

This is accomplished simply by a reversal of the instructions for its removal. In replacing see that the "notch" on the flange rim of the movement casing engages with the locating stud at the top of the opening in the center frame casting into which the movement casing fits.

The casing of necessity fits tight into the center frame casting, therefore do not attempt to force or hammer it in place. If it is correctly positioned you will be able to seat it perfectly in place by working gently with your hands only. If you attempt to force it you may cause great damage.

Re-Setting the Shutter.

In replacing the movement, the original shutter setting will not be disturbed if the following instructions are observed.

With the movement in position and before adjusting the sliding washers and clamping screws, turn the balance wheel until the sprocket is just ready to move. The balance wheel must be turned in its correct direction. Then turn the balance wheel still further until two teeth of the intermittent sprocket have passed a given point. This will be equivalent to moving the film one half a frame. At this point the active or cut-off blade of the shutter should be evenly spaced across the projecting lens. Or in other words, a line through the center of the shutter blade should be at the center of the lens. If the shutter is not in this position, withdraw the movement sufficient to disengage the balance wheel gear from mesh with the gear on the shutter drive shaft and turn the shutter so that it will be in proper position when the gears are again meshed.

Removing Single Bearing Intermittent Movement.

The same instructions given for removing the double bearing movement apply also to the single bearing movement supplied as regular equipment on the Motiograph Special Projector, except that in withdrawing the single bearing movement it is only necessary to turn it about a quarter turn instead of half a turn as in the double bearing movement. Also note that all other instructions given for the De Luxe projector apply as well to the Special mechanism except where otherwise noted.

Adjusting the Double Bearing Intermittent Movement

—NOTE—

Before attempting to adjust either the double bearing or single bearing movement, the movement must be removed from the mechanism. It is a mistaken idea that a movement can be correctly adjusted while in position in the mechanism. The correctness of the adjustment must be "felt" by turning the balance wheel by hand. With the movement in the mechanism, a whole train of gears is moved which makes it impossible to "feel" whether the adjustment of the movement is correct or not.

There are only three possible adjustments for the double bearing movement. These are the adjustment for end play of the intermittent sprocket or star shaft, adjustment for star and cam relation and adjustment for end play of the cam or balance wheel shaft. These adjustments should not be made until natural wear makes them necessary. As the movement is a very accurately fitted piece of mechanism and may be ruined by improper adjustment, we strongly advise against anyone making adjustment unless competent to do so.

To adjust end play in the star or intermittent sprocket shaft, loosen the set screw in the outer bearing of the star shaft and press inward on the plunger projecting from the outer bearing and retighten the set screw.

To adjust the star and cam relation, first loosen the set screw near the inner bearing of the double bearing bracket. While both bearings of the star shaft are always in alignment with each other, the outer circumference of the bearing next to the movement casing is made eccentric in relation to the center of the bearing hole for the star shaft, thus permitting the star to be adjusted to the cam without disturbing the alignment of the two star shaft bearings. This eccentric bearing is called the inner bearing. Now make the fine adjustment by means of the two screws on the adjustment bracket. These two screws operate against the projection on the double bearing bracket and provide micrometer adjustment. Back one screw off and tighten the other in the direction adjustment is desired. When adjustment has been completed retighten the set screw first mentioned.

Under no circumstances should the star be adjusted so tightly against the cam rim that even the slightest bind or drag will be apparent when turning the balance wheel by hand. If too close an adjustment is made, undue friction will result. This will be evidenced by rapid wear and scoring of the star and cam surfaces where they come in contact and they will be ruined. In addition the undue friction will develop heat and expansion of the parts which may result in a freezing or seizing of the working parts which will make the movement inoperative.

To adjust for end play of the cam or balance wheel shaft, loosen the two set screws on the side of the balance wheel. These two screws lock against two long screws which run through the diameter of the balance wheel and seat on two "flats" on the cam shaft. After loosening the first two screws, loosen also the two long screws. Now grasp the knurled retaining screw on the end of the cam shaft between the fingers and by pressing the balance wheel inward and drawing outward on the retaining screw, the balance wheel is pressed against the casing and the end play is taken up. Then reset the two long set screws and lock them by resetting the first two screws and the operation is completed.

Adjusting the Single Bearing Intermittent Movement.

Recessed in the boss which forms the support for the eccentric bushing and located very close to the inner flange of the intermittent sprocket, will be noted the head of the eccentric bushing locking screw. Loosen this screw about one half a turn and fit the special eccentric bushing wrench over the hexagon boss of the bushing. The eccentric bushing can now be moved either upward or downward, which action will move the star either closer to or further away from the cam.

Observe the same precautions against too tight an adjustment as is noted under adjusting instructions for the double bearing movement.

Adjusting Idler Roller Brackets.

The proper adjustment of the idler rollers makes it necessary that there shall be a distance equal to the thickness of two pieces of film between the rim of the idler roller and the face or flange of the sprocket. Looking inward to the mechanism, located very close to the pivot point of the idler roller bracket will be noticed a large flat headed screw. This is a clamping screw for the eccentric stop stud of the idler roller bracket casting. By loosening this screw and inserting a screw driver in the slotted end of the eccentric stop stud, same may be rotated to raise or lower the idler roller position in relation to the sprocket. When the proper adjustment has been obtained the large flat headed clamping screw is again tightened. As the idler rollers have been correctly adjusted when the mechanism left the factory there should be no occasion to make any adjustment until natural wear of the roller and sprocket face make it necessary. Careful attention should be given to see that the rollers revolve freely. Keep them clean and well oiled and free from accumulations of wax from the film. When a roller does not revolve it soon wears a flat surface. The roller is then useless and must be replaced.

Shutter Shaft Collar.

The shutter shaft collar is composed of three separate pieces; the collar hub with set screw, the shutter flange with locating dowel pin and the hexagon tightening nut. The purpose of the separate flange is to make it adjustable so that when its dowel pin is entered in the dowel pin hole in the shutter hub, the shutter may be properly set in time with the intermittent movement. An added convenience of this type of construction is that when once set, the shutter may be removed from the shaft and replaced without it being neces-

sary to reset it, as when the dowel pin on the flange engages with the dowel hole on the shutter hub the shutter must again take its exact previous position. This also permits the interchange of two and three wing shutters without resetting.

In the event that the intermittent movement has been removed and instructions for resetting the shutter have not been followed, it may be found on replacing the intermittent movement that the shutter is out of time. To correct this it is only necessary to loosen the hexagon nut on the shutter shaft collar, move the flange to the proper position to locate the shutter correctly in time with the intermittent movement and tighten the hexagon nut again.

Shutter Setting Device.

This device operates to provide accurate, fine adjustment of the shutter while the projector is in operation. It is placed on the take-up side of the mechanism and the adjusting knob will be found on the top front of the mechanism. Near the top of the front plate on the inside of the mechanism will be found a projecting boss through which the shutter setting device shaft passes. Directly under this boss will be found a hexagon nut through which the shaft also passes and under this nut a set collar. The purpose of the hexagon nut is to lock the shutter setting device so that it may not be unintentionally disturbed.

When mechanisms leave the factory the shutter is set as near accurately as factory conditions will permit and the shutter setting device is locked by setting up the hexagon nut. When the projectors are installed it may be necessary to refine the factory setting of the shutter by means of the shutter setting device.

First unlock the device by loosening the hexagon nut. Then while projecting film correct the shutter setting by turning the adjusting knob clockwise (or down) to correct "up travel" and counter clockwise (or up) to correct "down travel."

When the adjustment has been completed reset the hexagon nut to again lock the shutter setting device.

Film Gate.

Removing the film gate is a very simple operation when one or two small intricacies are understood. To remove, pinch the two small hinge pins at the upper part of the gate together. At the same time lift up the door latch at the bottom of the gate and bring the entire gate assembly straight out toward the lamphouse. To remove it completely, it will be necessary to lift the small stop hook at the bottom of the gate and disengage the gate slide link. These generally fall out of place with the natural removal of the gate and it is seldom that any particular attention is paid to their disengagement.

In replacing the film gate, first see that the automatic fire shutter is in its closed position, now that the stop hook at the bottom of the gate is placed in position, then the gate slide link. Now place the top of the gate between the hinge pin bearings and after seeing that the small yoke of the automatic fire shutter is in position to engage with the working link on the mechanism, pinch the hinge pins together and slip the gate into position.

Oiling Information

We wish to impress on the users of the Motiograph projector that it is a finely fitted and accurately made mechanism. It must therefore receive intelligent care and lubrication to deliver the perfect results it is capable of.

For the convenience of the user an oiling chart is shipped with each projector giving the location of all oil holes on the mechanism and suggestions for oiling. In addition to the mechanism, the take-up, motor and other obvious places require lubrication and must be given attention.

In oiling remember that one or two drops of oil properly applied will do more good than half an oilcanful splashed all over the parts.

Keep the mechanism clean and free from grease and oil where it is not needed. A dirty, oily mechanism is a dust collector and dust and grit cause excessive wear.

The proper lubricant for oiling the mechanism of the De Luxe projector where oil holes are provided is "DE LUXE ANTI FRICTION OIL." This is an oil which has been developed especially for the Motiograph De Luxe and Special projectors and has the proper consistency and lubricating properties for the carefully fitted parts of these projectors.

WE CANNOT HOLD OURSELVES RESPONSIBLE FOR THE USE OF OIL AND LUBRICANTS NOT HAVING THE PROPER LUBRICATING QUALITIES FOR OUR PROJECTORS.

For the intermittent movement, either the double or single bearing type, we advise the use of nothing other than "DE LUXE ANTI FRICTION GREASE." This is a semi solid grease also especially developed for our intermittent movements.

DO NOT ATTEMPT TO USE AUTOMOBILE GREASE, VASELINE, OIL AND GRAPHITE OR OTHER GREASES. THEY WILL RUIN YOUR INTERMITTENT MOVEMENT.

De Luxe Anti Friction Oil and De Luxe Anti Friction Grease is prepared and packed at the factory where your projector was manufactured and may be obatined from any Motiograph distributor or may be ordered direct from the factory.

—PRICES—

De Luxe Anti Friction Oil—

Per Bottle	$ .25
Per Quart	1.25
Per Gallon	3.65

De Luxe Anti Friction Grease—

Per 1 lb. can	1.50

Greasing the Double Bearing Intermittent Movement.

Unscrew the oil plug on the balance wheel side of the movement and force De Luxe Anti Friction Grease into the casing with the special grease gun supplied with all equipments. Do not fill the casing entirely full as the surplus grease will only be pumped out through the oil cup on the cam shaft and make a mess as well as waste the lubricant.

Greasing the Single Bearing Intermittent Movement.

Force De Luxe Anti Friction Grease into the intermittent casing through one of the small holes, located in the top of the casing, with the special grease gun. Do not fill too full as the surplus grease will only work out again through the filling hole.

—NOTE—

De Luxe Anti Friction Grease is also an ideal lubricant to use on the sliding disc of the shutter shaft assembly.

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The Motiograph Guarantee.

Motiograph De Luxe and Motiograph Special projectors are guaranteed against defects in workmanship and material for a period of ninety days after installation.

Repair Parts

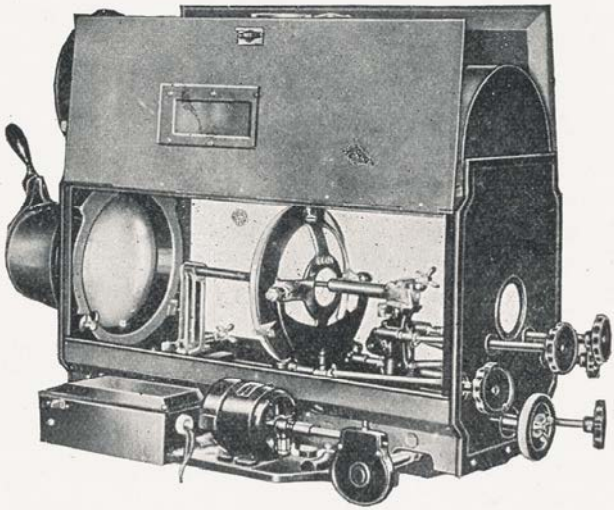
Ordering New Parts

To avoid unnecessary delay and correspondence, new parts should, where possible, be ordered from the distributor or dealer from whom the projector was purchased or from the nearest Motiograph distributor or dealer, who is generally in a position to supply it from his stock. If he cannot supply you, he can order it for you.

Where, however, conditions are such as in our judgment warrant it, we will fill orders for parts at current list prices, f. o. b. factory, provided the order is accompanied by cash. In ordering send the mechanism number and the model of the projector with an accurate description of the part desired, preferably accompanied with the exact catalog number. If this cannot be done, return the part tagged properly and with transportation charges paid. Otherwise we cannot promise to fill your order intelligently or give prompt service. Our responsibility ceases in all cases with delivery to the transportation company.

Returning Parts.

In the event parts are returned, transportation charges must be prepaid or the parts will not be accepted. They should be tagged properly with the name and address of the sender. A letter should be sent giving the reason for the return, the number of the mechanism they were taken from as well as the invoice number that the parts were originally billed on.



Motiograph Reflecting Arc Lamp

Instructions for Installation and Operation of Motiograph Reflecting Arc Lamps

The Motiograph Reflecting Arc Lamp is shipped complete in one shipping case. For convenience in packing, the stereopticon attachment, (or cone support if no stereopticon attachment is ordered) arc control assembly and attachment base are separated from the arc lamp proper and must be reassembled. The reflector, condenser, auxiliary stereo condenser, etc., are also packed separately.

INSTALLATION

1. The Motiograph Reflecting Arc sliding base casting is placed in position on the flat and round slide rods of the sliding carriage casting. See that the two stop collars are in place on the round slide rod, one collar on each side of the sliding base casting.

Place the Reflecting Arc Lamp on the sliding base attachment so that the four studs on the base enter the four holes in the top of the sliding base attachment. Be sure that the four knurled adjusting nuts are on the studs before placing the lamp on the sliding base.

2. Arc Control.

Attach the arc control assembly to the lamp. This assembly fits on the two studs projecting from the side of the Reflecting Arc Lamp base. In assembling the arc control be sure that the sleeve of the universal joint connection to the feed screw of the lamphouse engages fully with the shaft protruding from the gear housing of the arc control and tighten set screw in sleeve securely to shaft.

3. Stereopticon Attachment.

First lay the stereopticon attachment on a table flat side down and with the cone and dowser away from you. Remove the plate on which the stereopticon slide carrier is mounted, then the retaining ring beneath this. The auxiliary stereo lens is wedged shaped. One side has a concave or "hollowed out" curve and the opposite side is convex Place the auxiliary stereo lens in the holder so that the convex side is down and with the thick side of the wedge toward your right hand. Then place the retaining ring on top of the lens so that the pin projecting from the ring enters the slot of the holder. Gently work the lens into position so that the bevel side of the retaining ring rests securely on the lens, then replace the plate with the slide carrier so that the openings for inserting slides in carrier are upward or toward center of stereopticon attachment.

Now place the stereopticon attachment on the front of the lamphouse by inserting the bearing stud in the hole over the condenser holder and screw down the set screw to hold bearing stud in place.

4. Equipment Without Stereopticon Attachment.

Where no stereopticon attachment is used, the lamp is furnished with a cone and dowser mounted on a casting which is assembled to the lamphouse in the same manner as the stereopticon attachment.

5. Condenser Holder.

Remove the condenser holder from the lamphouse by turning the two wing buttons inside the lamphouse at the bottom of the holder so that the wings are pointed directly down and the one wing button at the top of the condenser holder so that the wing is directly up. By tipping the top of the condenser holder back toward the lamp it can easily be removed from the inside of the lamphouse.

Loosen the two thumb screws which clamp the retaining ring and lay the condenser holder on a table face down and with retaining ring uppermost. By placing the fingers of each hand on the inside of the retaining ring it may be drawn out of the condenser holder. Place the large 8 inch diameter condensing lens in the holder with the flat side down. (When in place on the lamphouse the curved side of the condenser faces the front carbon of the lamp.)

Replace the retaining ring in the same manner that it was removed, and while pressing it down on the lens tighten the two thumb screws to hold it secure. Then replace the condenser holder in the lamphouse and lock in position by turning the wing buttons.

6. Reflector.

Place the reflector in position in its holder by resting it first on the two bottom spring clips, then tipping it back and lifting the top spring clip until the reflector slips in place. The reflector should be held firmly in the clips. These clips are adjustable to permit this.

It is, of course, understood that the reflector and lenses were first carefully cleaned before placing them in position on the equipment. For perfect results these should be frequently cleaned.

This completes the assembling of the equipment on the projector.

7. Electrical Connections.

Detailed instructions are too lengthly to be given here; however, our distributors are fully informed as to proper rheostats to supply and proper connections made for each installation.

The positive lead of the supply line is connected to the front carbon holder wire clamp and the negative to the rear. The two leads from the arc control are connected to the projector arc lamp switch on the "dead" side, that is, it is so connected that when the switch is open no current flows to the arc control.

8. Adjustment.

Adjust the lamphouse forward or back until the front face of the 8 inch condensing lens is approximately 13 inches from the film track of the projector. (The distance from the front of the condensing lens to the film track will vary with the focal length of the projection lens.) Then loosen the lock nut on the feed screw handle of the lamp and turn the feed screw handle until the carbon holders are separated to limit of travel. Insert the small carbon in the rear or negative carbon holder and the large carbon in the front or positive carbon holder. Each carbon should protrude exactly the same distance from each holder. Feed carbons together until points touch.

By means of the adjusting handle immediately to the right of the feed screw handle, adjust the lamp carriage or bed so that it is half way of its adjustment. Now loosen the thumb screw on the side of the reflector carriage (this will be found on the side toward the arc control) and pull the entire reflector assembly to the rear, until the distance from the points of the carbons to the hole in the reflector is about 4 inches.

9. Carbon Sizes.

For 20 to 25 amperes, use a combination of 8 millimeter negative and 12 millimeter positive carbons. For 15 to 20 amperes use a combination of 7 millimeter negative and 10 millimeter positive carbons. The Motiograph Reflecting Arc Lamp is regularly furnished with carbon holders for the 8 m/m and 12 m/m combination since that is most frequently used. For the 7 m/m and 10 m/m combination a special insert for the negative holder and special clamping member for the positive holder is necessary. These are interchangeable with those supplied with the lamp and may be ordered separately or the lamps may be ordered furnished with them.

10. Arc Length or Gap.

For perfect results the arc gap or separation of carbons should be about 3/16″ to ¼″ for from 20 to 25 amperes, and ⅛″ to 3/16″ for from 15 to 20 amperes. The proper arc gap is secured by adjusting the arc control by means of the adjustment screw and lock screw at the front end of the arc control box.

11. Arc Crater.

One of the most important points in the operation of the Motiograph Reflecting Arc Lamp is the perfect formation of the crater. One hundred per cent efficiency is obtained only when the crater is directly facing the reflector so that the reflector is able to pick up all of the light. When the crater slants off sideways or up or down the reflector cannot pick up all of the light available. Careful watching of this point insures perfect results.

12. Negative Carbon Adjustment.

The adjustment of the negative carbon controls the crater formation. Raise, lower or swing it sideways by means of the adjusting handles until the rim of the crater is parallel to the front edge of mirror in all directions.

13. Arc Control Adjustment.

Before attempting the optical alignment of the equipment it is essential that the arc control be perfectly regulated and the negative carbon correctly adjusted to obtain a perfect arc gap and crater formation.

First open the switch on the arc control box (this is an indicating switch and is open when the white lines near the lever are out of sight) then strike the arc. On a new trim of carbons allow the lamp to burn until a perfect crater has been formed. While this is burning, adjust the negative carbon to form a perfect crater.

Carefully feed the carbons by hand until the crater has formed perfectly and the proper arc gap is obtained. Close the arc control switch and loosen the thumb screw over the adjusting screw just enough to allow the adjusting screw to be turned Turn the adjusting screw until the arc control just feeds intermittently when the arc gap is the right length. Then lock the adjusting screw by tightening the thumb screw. Now tighten the wing lock nut on the arc lamp feed handle and the arc control will automatically feed the carbons.

The arc control adjusting screw is very sensitive and care just must be observed to get the correct adjustment. Let the lamp burn a while and if the arc gap becomes too long, screw in the adjustment screw until the control feeds the carbons to the proper gap. If the gap is too short turn the adjustment screw out.

14. Adjustments Inside Arc Control.

The mechanism inside the arc control box is perfectly adjusted at the factory and you are cautioned not to attempt making adjustments here. This mechanism should operate over an indefinite period without attention. The only attention this should ever require, and that only after a long period of operation, would be the cleaning of the contact points of the relay. To do this back off the adjusting screw directly above the spring connecting the relay armature with the arc gap adjusting screw and by pressing the relay armature with the fingers to open the contact points, insert between the contact points a piece of "00" emery paper so folded that the emery will wipe both points at once. Gently draw this between the points to brighten them, lightly pressing the armature against the emery paper with the fingers at the same time. Then repeat this process with a plain piece of paper to remove any emery dust between the contacts.

Now readjust the adjusting screw so that there is just sufficient play between the points to allow the motor circuit to be broken. The actual separation is about six thousandths of an inch. **Never** disturb the position of the adjusting screw over the magnet coils. This has been adjusted at the factory.

15. Optical Adjustment and Alignment.

CAUTION!

Do not attempt to make this adjustment until the foregoing instructions have been carefully observed and a perfect crater and arc gap obtained, and the arc control perfectly regulated.

Open the door of the lamphouse and push the entire reflector assembly forward until a circle of light appears on the outside rim of the condenser holder on the inside front of the lamphouse. By means of the reflector adjustment handles, center this circle of light until it is concentric with the condenser, that is, until the circle of light is evenly spaced in relation to the circumference of the condenser. When this is done, your reflector is optically centered with the condensing lens. Now draw the entire reflector assembly to the rear (without disturbing any of the adjustment handles) until the circle of light on the rim of the condenser gradually becomes smaller until a point is reached where it just fills the condenser opening. At this point the condenser is receiving all of the light possible. Now tighten the thumb screw on the reflector carriage securely which will locate the reflector carriage in its permanent position from which it should not be moved when once set. Now examine the spot of light on the cooling plate of the mechanism. If it is not centered, **do not** adjust the reflector to center it at this time, and pay no attention to the size of the spot. Slide the lamphouse sideways until the spot is centered in this direction and adjust the stop collar on the round slide rod against the sliding base attachment. If the spot is now too high or too low, raise

or lower the whole lamphouse by means of the four knurled adjusting nuts on the studs underneath the lamphouse base and between it and the sliding base attachment until the spot is centered for height on the cooling plate of the machine. In doing this see that all of the nuts are adjusted equally in order to keep the lamp true to the optical line. This is an imaginary line drawn through the centers of both carbons, aperture plate, projection lens and center of screen.

When the foregoing operation has been completed, **see that no film** is in the machine and open the fire shutter to allow the light to pass through to the screen. Now move the whole lamphouse forward and back without disturbing any of the adjustments until the light on the screen is even and at its brightest point. Then lock the lamp carriage to this position.

The size of the spot of light at the cooling plate now determines the size that should be maintained in operation. If it appears somewhat larger than that given by the vertical arc you have been accustomed to, do not make it smaller in the mistaken idea that you are losing light but keep the spot at the size where best screen results show it should be.

16. Operation of Stereopticon Attachment.

The operation of the stereopticon attachment is obvious, it being merely necessary to release the latch at the bottom and rotate the attachment until the latch locks it automatically in position for showing slides. Reverse this operation when returning to film projection.

The regular dowser on the cone for film projection reverses and acts as a dowser for slide projection also. No cone is needed on the stereopticon and none is furnished. In operating dowser it will be found more convenient to move dowser handle away from you to open dowser and toward you to close, instead of the usual method which is the reverse of this.

17. Alignment of Slide on Screen.

If the equipment has been properly installed, the slides should line up square on the screen. If they do not, loosen the two screws which attach the plate carrying the slide carrier to the stereopticon auxiliary lens holder and square the slide on the screen, then retighten the screws. If sufficient adjustment cannot be obtained in this way, further adjustment may be made by the four knurled adjusting nuts under the lamphouse. Loosen two of the nuts on one side and tighten two on the opposite side an equal amount. This will square up the slide on the screen without disturbing the position of the spot on the cooling plate, if it is done correctly.

18. Points on Care of Equipment.

Keep lenses and reflector clean.

Do not use arc lamp lubricant on the lamp unless it is Motiograph Arc Lamp Lubricant, and use this **sparingly.**

Oil places where oil holes are provided with same oil used on mechanism.

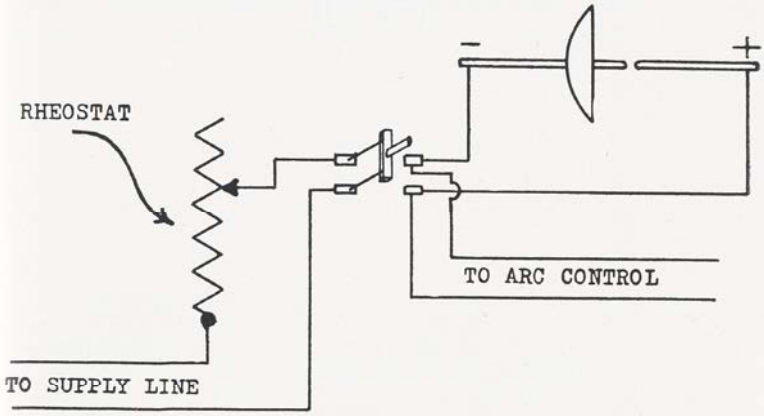
Do not loosen stop collars on carbon clamping screws. These were set at the factory. The clamping action on the carbon holders is very powerful and too much pressure will only result in breaking parts. For the same reason, do not use pliers on the clamping wheels. Use your fingers—the clamping wheels do not get too hot for them.

Do not "monkey" with the arc control mechanism. This was perfectly adjusted at the factory except for the arc gap adjustment.

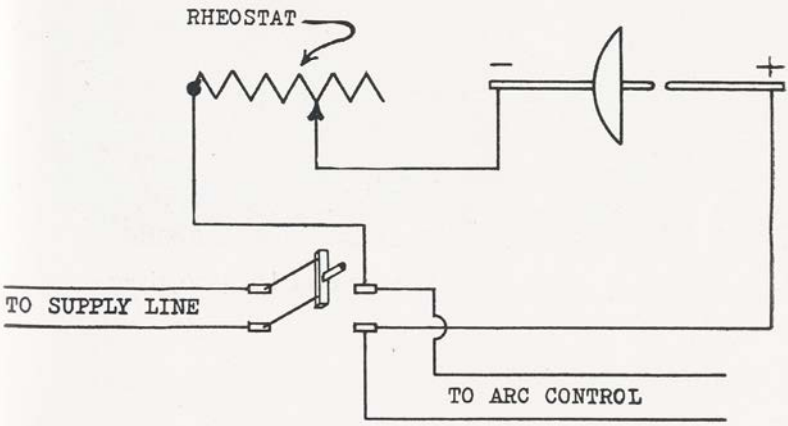
Do not use more than 25 amperes of current. You cannot obtain more light by using more current with this lamp. You **can** invite trouble and unsatisfactory operation if you do.

When inserting a new trim of carbons, take note of the distance the crater is from the front edge of the mirror. Insert your new rim so the point of the positive carbon is at this distance and only slight adjustment for spot size will be necessary. A mark on the lamphouse wall opposite the correct crater position may be made as a guide for inserting new trims.

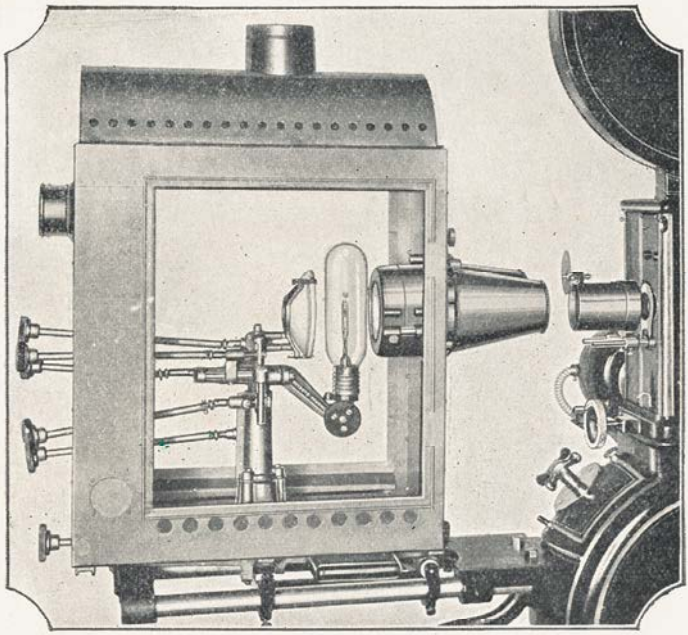
WIRING DIAGRAM
MOTIOGRAPH REFLECTING ARC LAMP



CORRECT HOOK-UP



INCORRECT HOOK-UP



Motiograph De Luxe Incandescent Lamp Equipment

Instructions for Installation and Operation of Motiograph De Luxe Incandescent Lamp Equipment

The Motiograph De Luxe Incandescent Lamp Equipment consists of three essential elements. These are the Lamp Fixture and Lamphouse, Relay Condenser Lens and Mount, and the Current Regulator.

Attaching the Relay Condensing Lens and Mount.

First attach the relay lens mount to the projector mechanism. This fastens to the film gate door with the four screws which will be found on the film gate door. In attaching, it will be necessary to remove the cylindrical sheet metal part with the relay lens mount casting from the slide rods. The slide rods are positioned on the bottom.

Now turn the sheet metal cylinder, which action will separate it from the casting which forms the relay lens mount and place the relay lens in position in its mount. The lens is inserted so that when in its correct position, its curved surface faces the lamphouse. Replace the sheet metal cylinder in position which will lock the relay lens in place.

Attaching Lamphouse.

The lamphouse is now placed in position on the sliding carriage as previously instructed under instructions for attaching lamphouses. Slide the lamphouse back so that its front wall is approximately 18 inches from the film track of the mechanism.

Installing Condensers.

Next place the Cinephor condensing lenses in position in the lens mounts of the lamphouse. The 5½″ diameter lens is placed in its mount so that its strongest curve faces the mechanism. This is the front lens and should be placed in the lamphouse first.

Place the 4″ diameter lens in position in its mount also with its strongest curve facing the mechanism and place it in position in the lamphouse.

Attaching Current Regulator.

Provision is made for attaching the current regulator directly on the projector underneath the lamphouse. It is attached to the casting at the rear of the two large round slide rods of the projector. This casting has two downward projecting bosses which are drilled and tapped to receive the attaching screws. The current regulator is turned so that its feet are upward and the operating handle is toward you. In this position it is lifted in place under the rear portion of the projector so that two screws inserted through the holes in the feet to the left of the regulator engage with the tapped holes of the casting at the rear of the two large round slide rods. For the right hand feet of the regulator, a clamping casting is provided which clamps to the diagonal brace rod on the projector. This clamping casting has two tapped holes for the screws which are inserted through the holes in the feet on the right hand side of the regulator.

Wiring Connections.

Note the terminal box on the rear of the current regulator. In this box will be found four wire terminal screws. Two of these are marked "LINE" and two "LAMP." The two wires from the main current supply line are first attached to the bottom terminals of the enclosed switch furnished with the projector. This switch is to be mounted on the casting at the rear of the two large round slide rods of the projector and to which the current regulator is attached. Next run two wires from the top terminals of this switch to the two screws in the terminal box of the regulator marked "LINE." Now attach a wire to one of the screws in the terminal box of the regulator marked "LAMP" and carry this wire through the lamphouse and attach it to the screw on the arm casting which clamps the incandescent lamp in position. Attach a second wire to the other terminal in the regulator terminal box marked "LAMP" and carry this wire into the lamphouse and attach it to one of the terminals of the Ammeter which project inside the lamphouse. Provide a shorter wire long enough to reach from the incandescent lamp socket, when the socket is clamped in its proper position on the lamp fixture, to the other terminal on the Ammeter and connect it properly to the ammeter terminal and the lamp socket. This completes the wiring.

Installing the Reflector.

Clean the reflector and insert it in the reflector holder by resting it on the two lower spring clips. Lift the upper spring clip and tip the reflector back in position and it will be held secure when the upper spring clip is released.

Now adjust the reflector by means of the adjusting handle so that it is either up or down to the limit of the adjustment. This is to purposely throw it out of position so its reflected image will not be confused with that of the lamp when further adjustments are made.

Installing Lamp.

First remove the lamp socket from its clamp and screw the lamp down in it firmly. Now clean the lamp carefully and place the socket in its position on the clamping bracket of the lamp fixture. Before clamping tightly in position, see that the lamp filaments are parallel with the rear face of the back condenser, that is, the four filament coils of the lamp should directly face the condenser.

Now adjust the entire lamp fixture forward so that the lamp bulb is within ¼ inch of the surface of the rear condenser mount.

Lighting the Lamp.

First set the current regulator handle to its lowest position. With the current regulator as attached to the Motiograph projector, the handle is at its lowest position when moved as far as it will go in the direction toward the screen. Next close the main line switch on the rear of the projector and move the handle on the regulator until the pin on the release catch comes against the stop. When in this position the current passes through a warming coil in the regulator and prevents a sudden rush of current to the lamp. This will bring the lamp filament to a glow. Then push the release lever and advance the regulator handle gradually until the ammeter on the back of the lamphouse registers 30 amperes.

CAUTION!

NEVER OPERATE THE LAMP AT OVER 30 AMPERES. To do so may cause the lamp to burn out shortly and in any event will materially shorten its life.

Optical Alignment of Lamphouse.

Loosen the set collars which have been placed one on each side of the lamphouse base on the round slide rod and adjust the lamphouse sideways so that it is exactly in optical line. It is optically in line when an imaginary line would exactly strike the center of the condensing lenses in the lamphouse, the center of the aperture in the mechanism and the center of the projection lens in the mechanism.

When so positioned, lock the set collars against the lamphouse so that it will not be moved from this position.

When stereopticon attachment is used, the lamphouse must slide over on the slide rods to position for projecting slides, therefore the optical alignment of the lamphouse must be located with the set collar on the operating side of the lamphouse and the set collar on the opposite side adjusted to form a stop for the lamphouse when slid over in position for projecting slides.

For convenience in making further adjustments the current regulator handle should now be turned back so that the ammeter will register 25 amperes.

Adjusting the Lamp.

First close the dowser on the lamphouse. It will be noticed that in the center of this dowser there is a small pin hole. This pin hole is to project an image of the lamp filaments on the small dowser on the relay lens mount. See that this relay lens mount dowser is now also closed.

Now by means of the two adjusting handles which govern the raising and lowering, also the sideways adjustment of the lamp, adjust the lamp so that the projected image of its filament is centered exactly on the dowser of the relay lens mount.

When this is done, adjust the reflector by means of its adjustment handles until a reflected image of the lamp filaments is also projected on the relay condenser mount dowser. Then adjust the reflector forward or back until the reflected image of the lamp filament and the real image projected by the lamp itself are exactly of the same size. The remaining adjustment of the reflector is to see that the reflected image of the filaments from the reflector is meshed in between the real image of the lamp filament so that the open spaces between the filament coils are filled by the reflected image from the reflector, thus forming a perfect, solid square of light on the relay lens mount dowser.

Clearing the Field.

First adjust the current regulator to register 30 amperes on the ammeter. Lift up the automatic fire shutter on the mechanism, also the relay lens mount dowser and the dowser on the lamphouse. It is understood, of course, that there is no film in the projector at this time. This will allow the light to pass on to the screen.

In order to secure a clear, even screen with the greatest illumination, it will be necessary to adjust the entire lamphouse forward or backward, sliding it on the sliding carriage without disturbing any of the adjustments just made, until best screen results are secured. In locating the lamphouse forward or backward at different positions, also move the relay lens mount forward or backward on its slide rods until a position will be found for both it and the lamphouse which gives the brightest light and an even screen illumination. A final adjustment after the position for the relay lens and mount and the lamphouse has been determined, is to adjust the entire lamp and lamp fixture forward and back in the lamphouse until the best position has been found.

Stereopticon Attachment.

The stereopticon attachment consists of a swinging casting carrying the dowser and cone for motion picture projection and the slide carrier and cone for slide projection. Behind the slide carrier is the mount for the 5¼″ negative stereo lens. This lens should be mounted so that its flat side faces toward the lamp in the lamphouse.

Adjusting the Stereopticon Attachment.

It is merely necessary to swing the attachment to bring the slide carrier before the condensing lenses on the lamphouse and slide the entire lamphouse over to line up with the stereopticon objective lens. Adjust this lens and the lamphouse until the slide image is correctly positioned on the screen. Then adjust the set collar on the round slide rod so that the lamphouse will come against it as a stop.

Projection Lenses.

To obtain best results with incandescent lamp equipment, projection lenses of the larger diameter, commonly known as number two or series II or III lenses should be used.

PROPER POSITION OF THE VARIOUS OPTICAL ELEMENTS OF MOTIOGRAPH DE LUXE INCANDESCENT LAMP EQUIPMENT